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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,448	06/22/2006	Junko Makita	1190-0627PUS1	4160
2292 7590 12/26/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
TEJANO, DWIGHT ALEX C				
ART UNIT		PAPER NUMBER		
4112				
NOTIFICATION DATE		DELIVERY MODE		
12/26/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/584,448

Applicant(s)

MAKITA ET AL.

Examiner

Dwight Alex C. Tejano

Art Unit

4112

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 Jun 2006 and 15 Feb 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/08)
- Paper No(s)/Mail Date 22 Jun 2006, 20 Jun 2007
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 21, 22, 24, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuruoka, et al (US 6,721,003.)

Note 1: The claimed "spectral characteristic" is a broad term that is interpreted to be a simple "color," that is, a pixel visually exhibiting some value ("characteristic") of the visible light spectrum. The Applicant's own disclosure supports this interpretation: "having spectral characteristics corresponding to the red (R), green (G), and blue (B)..." [0042.] The Examiner, thus, uses the terms interchangeably.

Note 2: The claimed "regression analysis... [according to] $y = ax + b$ " is also known as "linear regression," with both terms used interchangeably by the Examiner.

Regarding **claim 21**, Tsuruoka, et al. (hereafter referenced as "Tsuruoka") discloses an image processing apparatus and processing program.

Specifically, Tsuruoka discloses a two-dimensional pixel array with each pixel having some K-th or L-th (where K and L are positive integers) spectral characteristic (R, G, B.) (Fig. 3 a,b,c)

Additionally, Tsuruoka teaches a regression analysis means ("linear interpolation section," 116) for performing linear regression between a plurality of pixel positions in an area neighboring the first pixel position of interest [18] (Fig. 4c), along with a correlation expression between the pixel signals having the K-th spectral characteristic and the pixel signals having the L-th spectral characteristic [20] (Fig. 6.)

Furthermore, Tsuruoka teaches a calculating means ("calculation section," 107) for determining the pixel signal having the L-th spectral characteristic at the first position of interest by applying a conversion formula based on the regression line to the pixel signal having the K-th spectral characteristic at the first pixel position of interest [20.]

Similarly, Tsuruoka specifically discloses a selection means ("uniform region extraction section," 111) for sequentially selecting different pixels as the pixel of interest and using the regression analysis means and calculating means upon the new pixel of interest ("sequentially loads R, G, and B signals...") [12.]

Regarding **claim 22**, Tsuruoka discloses everything as claimed in claim 21, as discussed above. Furthermore, Tsuruoka inherently discloses a selection means in order of the strength of correlation between spectral characteristics. Tsuruoka discloses that the process of scanning the pixels occurs with respect to a classification system based on gradients of a local region. Tsuruoka also discloses that the class with the

greatest number of regions ("strong correlation") is evaluated first. Given this, the claimed "selection means in order of strength of correlation" is considered disclosed by Tsuruoka.

Claims 24 and 25 are inherent method variations of the apparatus of claims 21 and 22. They are thus interpreted and rejected for the same rationale as presented previously.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuruoka.

Regarding **claim 23**, Tsuruoka meets all of the limitations of claim 22, as disclosed in the previous section. Furthermore, Tsuruoka also discloses an imaging device with R, G, B spectral characteristics (Fig. 3A, 3B, 3C.)

However, Tsuruoka fails to disclose the selection means as determining the specific order as claimed of pixel signals for comparison (specifically, G-R, G-B, R-G, B-

G, B-R, R-B.) Despite this, such a practice is obvious of one of ordinary skill, supported by Tsuruoka.

Tsuruoka discloses in [21] by example that the R-G relationship is evaluated first (Fig. 6); that is, determining the placement of red pixel signals in green pixel positions and vice versa. Further, Tsuruoka discloses that the "linear formula is also done for G-B and R-B signals."

Because the process is evaluated with respect to each pixel individually (i.e., the neighborhood for one pixel is not the same as the neighborhood for another pixel) and is done with every color relationship (R-G, R-B, B-G) with separate linear regression analyses, the outcome of one evaluation would not change the outcome of another evaluation. As such, the color relationships can be evaluated in any order in the process without changing the outcome of each evaluation.

Therefore, the claimed process would have been obvious to one of ordinary skill in the art because the particular process is immaterial compared to the evaluation of another pair of pixel signals and, as such, was recognized as part of the ordinary capabilities of one skilled in the art.

Claim 26 is an inherent method variation of the apparatus of claim 23. It is thus interpreted and rejected for the same reasons as presented previously.

Citation of Pertinent Art

The prior art made of record is considered pertinent to the applicant's disclosure, but is not relied upon as a reference for the preceding sections:

- Nomura, et al. (US 20050094007 A1) discloses an image processing apparatus, method, and program inclusive of a demosaic interpolation.
- Kakarala, et al. (US 7088392 B2) discloses an digital image system for adaptive demosaicing.
- Mitsunaga, et al. (US 20050088550 A1) discloses an image processing apparatus and method that is inclusive of a nearest neighbor interpolation of demosaic processing.
- Huang, et al. (US 7333678 B1) discloses a 5 x 5 neighborhood demosaic system.
- Olding, et al. (US 6970597 B1) discloses a neighborhood based pixel interpolation method.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwight Alex C. Tejano whose telephone number is (571) 270-7200. The examiner can normally be reached on Monday through Friday 9:30-6:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jefferey F. Harold can be reached on (571) 272-7519. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dwight Alex C Tezano
Examiner
Art Unit 4112

/Dwight Alex C Tezano/
/Jefferey F Harold/
Supervisory Patent Examiner, Art Unit 4112